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LEATHER MAKING POTENTIALITY OF CATTLE HIDES OBTAINED FROM FALLEN (DEAD) AND SLAUGHTERED ANIMALS. PART II*

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Market quality fallen and slaughtered hides collected from different centres are converted into full chrome shoe upper leather; the leather making potentiality of fallen hides is compared with that of slaughtered hides. The market quality fallen hides are found to be roughly of the same quality as the slaughtered hides. The qualities of finished leathers produced from slaughtered and fallen hides are comparable. The present investigation shows that the leather making property of fallen hides is dependent on their quality in the raw state and that there is no inherent difference between fallen and slaughtered hides arising simply out of the fact that the animal is fallen or slaughtered.

Introduction

In a previous study[1] on the comparative leather making property of slaughtered and fallen cattle hides, samples of fallen hides were collected at random from the Flaying and Carcass Utilisation Centres and the slaughtered hides from slaughter houses. A good portion of such fallen hides was found to be poorer in quality than the corresponding slaughtered hides. Such deterioration in quality was due to microbial action on account of prolonged delay in flaying and curing, inadequate cure and careless handling. In India, fallen and slaughtered hides are graded according to their qualities; hides of the same quality are mixed together and then marketed. Slaughtered hides available in hide markets are not always obtained from organised slaughter houses but also from private butchers in the countryside. Hence it was considered worthwhile to verify and compare the leather making properties of market quality fallen hides with those of market quality slaughtered hides.

Materials and methods

Twelve slaughtered and twelve fallen cattle hides were collected from hide markets in Agra, Meerut and Jullundur in Northern India; twentyfour slaughtered and twentyfour fallen hides were obtained from raw hide dealers in Coimbatore, Bangalore and Ernakulam in Southern India.

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Table 1

VISUAL ASSESSMENT OF MARKET QUALITY SLAUGHTERED AND FALLEN HIDES

Quality	Slaughtered	Fallen
	%	
Northern Region (12 hides)		
Prime	33·33	16·67
Second	58·33	58·33
Third	8·33	25·00
Rejection	Nil	Nil
Southern Region (24 hides)		
Prime	33·33	33·33
Second	45·83	50·00
Third	16·67	12·50
Rejection	4·17	4·17

Table 2

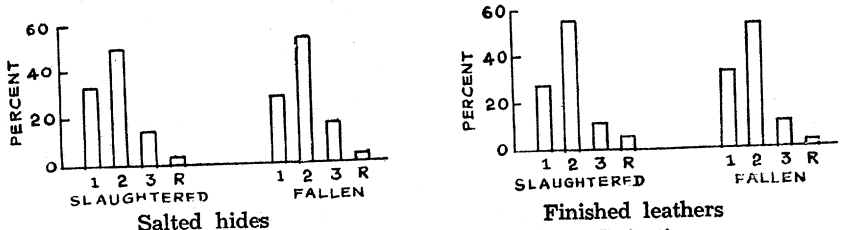
HISTOLOGICAL ASSESSMENT OF MARKET QUALITY SLAUGHTERED AND FALLEN HIDES

Quality	Slaughtered	Fallen
	%	
Northern Region (12 hides)		
Good	50·0	50·0
Fair	41·67	41·67
Poor	8·33	8·33
Very poor	Nil	Nil
Southern Region (24 hides)		
Good	25·0	25·0
Fair	70·83	70·83
Poor	4·17	4·17
Very poor	Nil	Nil

Visual and histological assessment of the hides was made according to the methods reported earlier.[1] Tensile strength and elongation of the hides were determined after dehydration with acetone. Hides and finished leathers were analysed for (i) moisture, ash, fat and hydroxyproline and (ii) moisture, chromium oxide, fat and hide substance respectively as done earlier.[1] The procedure for grading the finished leathers and physical testing of the leathers has also been reported in the previous work.[1]

Results

Visual assessment of the quality of slaughtered and fallen hides is given in Table 1. The qualities of slaughtered and fallen hides collected from different places in Northern and Southern India, as assessed by visual inspection, are comparable to each other without any great variation. The average classification of the total number of hides collected from the northern and southern regions is presented in Fig. 1.



1. Prime; 2. Second; 3. Third; R. Rejection

FIG. 1. Visual assessment of the qualities of slaughtered and fallen hides as well as finished leathers

Classification of the hides as assessed by histological study is given in Table 2. This again shows that there is practically no variation in quality between the market quality slaughtered and fallen hides.

Tensile strength and elongation of the acetone dried hides are given in Table 3. The tensile strength of acetone dried samples of market quality fallen hides is comparable to that of market quality slaughtered hides. Elongation, however, appears to be higher in fallen hides than in slaughtered hides. On the other hand, strength-elongation product is found to be higher in fallen hides from northern and southern regions.

The data on chemical analysis of the slaughtered and fallen hides are presented in Table 4 which shows that chemical composition of the fallen hides collected from different hide markets does not vary to any appreciable extent from that of market quality slaughtered hides. This is quite probable in view of the fact that the fallen hides that are generally brought to the hide market are collected in time, cured in a better way and resalted, if necessary.

It is apparent from Table 5 that the qualities of the finished leathers obtained from market quality fallen hides are very well comparable to those of market quality slaughtered hides. Classification

Table 3

PHYSICAL PROPERTIES OF ACETONE DRIED HIDES

		Tensile strength (lb./sq. inch)	Elongation %	Strength-elongation product (lb./sq. inch)
Northern Region				
Slaughtered hides	Maximum	10530	62·5	326453
	Minimum	3463	31·0	159320
	Average of 12 hides	5508	45·0	237723
Fallen hides	Maximum	9151	55·0	404130
	Minimum	4948	35·0	173180
	Average of 12 hides	7446	48·0	326844
Southern Region				
Slaughtered hides	Maximum	6697	75·0	461127
	Minimum	3729	40·0	227295
	Average of 24 hides	5479	62·0	335266
Fallen hides	Maximum	7042	84·0	510545
	Minimum	4451	40·0	285562
	Average of 24 hides	5420	68·0	371937

Table 4

CHEMICAL COMPOSITION OF MARKET QUALITY SLAUGHTERED AND FALLEN HIDES

		Moisture %	Ash %	Fat %	Hydroxyproline %
Northern Region					
Slaughtered hides	Maximum	44·0	18·3	8·0	13·0
	Minimum	31·2	15·5	2·32	11·5
	Average of 12 hides	40·0	17·3	5·37	12·3
Fallen hides	Maximum	42·4	18·2	9·73	13·5
	Minimum	36·0	13·0	3·41	11·0
	Average of 12 hides	39·8	16·4	5·70	12·3
Southern Region					
Slaughtered hides	Maximum	42·0	18·1	4·86	12·0
	Minimum	36·0	13·4	3·02	10·0
	Average of 24 hides	40·0	15·2	3·80	11·0
Fallen hides	Maximum	44·0	17·8	4·65	12·0
	Minimum	35·0	13·4	3·0	9·0
	Average of 24 hides	39·0	15·5	3·80	10·5

of the total number of leathers from slaughtered and fallen hides based on their qualities is presented in Fig. 1.

The physical properties of the leathers made from slaughtered and fallen hides are presented in Table 6. Though there may be considerable variations between the maximum and minimum values both in case of slaughtered and fallen hides, the average values for tensile strength, elongation, stitch tear strength, tongue tear strength, grain cracking strength and bursting strength of leathers obtained from market quality fallen hides do not differ to any considerable extent from the corresponding average values of leathers from market quality slaughtered hides (Table 6). Average values

Table 5

VISUAL ASSESSMENT OF THE QUALITY

Quality finished leather	Slaughtered	Fallen
	%	
Northern Region (12 hides)		
Prime	33·33	33·33
Second	50·00	58·33
Third	16·67	8·33
Rejection	Nil	Nil
Southern Region (24 hides)		
Prime	25·0	33·33
Second	58·33	50·0
Third	8·33	12·50
Rejection	8·33	4·17

Table 6

PHYSICAL PROPERTIES OF FINISHED LEATHERS FROM MARKET QUALITY SLAUGHTERED AND FALLEN HIDES

		Tensile strength (lb./sq. inch)		Elongation %		Stitch tear strength (lb./inch)		Tongue tear strength (lb./inch)		Grain cracking strength (lb./inch)	Bursting strength (lb./sq. inch/inch)	Strength–elongation product (lb./sq. inch)	
		⊥	∥	⊥	∥	⊥	∥	⊥	∥			⊥	∥
Northern Region													
Slaughtered	Max.	7297	6119	60·0	59·0	2014	1913	521	469	23207	>25000	364850	253624
	Min.	2118	2437	27·5	34·0	857	780	190	222	4826	6096	65092	82994
	Average	4260	3885	48·0	44·5	1563	1401	378	345	10463	13604	206376	180934
Fallen	Max.	6472	6543	64·0	62·5	2117	1934	508	535	19878	23466	362125	310792
	Min.	2380	1805	32·5	27·5	1080	1048	240	209	6209	7620	88758	49637
	Average	4117	4184	51·0	44·0	1487	1432	375	361	10817	14992	212589	190644
Southern Region													
Slaughtered	Max.	6321	6592	65·5	55·0	1915	1882	531	508	18288	18473	380751	355938
	Min.	3225	2726	40·0	37·5	1295	974	319	305	4620	11006	129000	119944
	Average	4682	4052	55·0	47·0	1613	1398	414	375	9366	15560	261491	190871
Fallen	Max.	6591	6491	72·0	55·0	1916	1974	533	466	17780	20956	346808	357005
	Min.	2782	2354	40·0	36·0	1088	986	264	254	4670	9698	139100	103576
	Average	4535	3930	54·0	46·0	1516	1518	378	340	10067	15032	243145	187292

for strength-elongation product also appear to be close to each other.

Chemical analysis of the leathers produced from slaughtered and fallen hides is given in Table 7. Chemical composition of the leathers obtained from slaughtered and fallen hides appears to be practically identical.

Discussion

The leather making potentiality of market quality fallen hides collected from Northern and Southern India has been ascertained and compared with that of the market quality slaughtered hides. It is quite apparent from the visual and histological assessment of the raw hides that fallen hides are comparable to the slaughtered hides in raw quality. The average tensile strength being roughly identical, the percent elongation appears to be slightly higher in acetone dried fallen hides. Chemical analysis of the hides also does not reveal any significant difference between the fallen and slaughtered hides.

Visual assessment of the finished leathers indicates that leathers produced from market quality fallen hides compare quite well with the leathers from slaughtered hides. Physical properties and chemical composition of the leathers also support this observation. The present investigation thus supports the view expressed in the previous study[1] that the leather making potentiality of fallen hides depends on their raw quality i.e., if the qualities of the fallen raw hides are comparable to those of slaughtered raw hides, their leather making potentialities are also comparable and that there is no in-

Table 7

CHEMICAL ANALYSIS OF THE FINISHED LEATHERS FROM MARKET QUALITY SLAUGHTERED AND FALLEN HIDES

		Moisture	Cr_2O_3	Fat	Hide substance
		%			
Northern Region					
Slaughtered	Maximum	12·57	3·91	4·65	65·32
	Minimum	11·27	3·61	3·34	63·53
	Average	11·92	3·75	3·84	64·74
Fallen	Maximum	12·97	3·99	4·51	64·85
	Minimum	11·33	3·70	3·66	63·26
	Average	12·04	3·84	4·10	64·54
Southern Region					
Slaughtered	Maximum	17·0	4·55	4·55	65·5
	Minimum	13·0	3·84	3·25	64·0
	Average	15·0	4·20	3·95	64·5
Fallen	Maximum	17·0	4·55	4·22	65·0
	Minimum	13·5	3·25	3·22	63·0
	Average	15·0	4·08	3·78	64·5

herent difference between the two types of hides arising out of the animals being slaughtered or dying due to other causes. It has already been pointed out that fallen hides are often sold in Indian market according to their quality and so very poor quality hides are not generally brought to the market and hence the better quality fallen hides are obtained from the market.

Acknowledgment

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REFERENCE

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